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WDB
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Atty Docket W9543-01
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PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional)

W9543-01

In re Application of
HOEFER ET AL.

Application Number

10/138/854

Filed

November 18, 2005

Aerobically Compatible Material Comprised of Porous Functional Solid Incorporated in a
Polymer Matrix

Group Art Unit

1794

Examiner

CHANG, Victor S.

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and appropriate non-small-entity fee are as follows (check time period desired):

- ☐ One month (37 CFR 1.17(a)(1)) (Fee Code 1251) \$ _____
- ☒ Two months (37 CFR 1.17(a)(2)) (Fee Code 1252) \$ 490.00
- ☐ Three months (37 CFR 1.17(a)(3)) (Fee Code 1253) \$ _____
- ☐ Four months (37 CFR 1.17(a)(4)) (Fee Code 1254) \$ _____
- ☐ Five months (37 CFR 1.17(a)(5)) (Fee Code 1255) \$ _____

☐ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown above is reduced by one-half, and the resulting fee is: \$ 0.00

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☐ The Commissioner has already been authorized to charge fees in this application to a Deposit Account.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment, to Deposit Account Number 07-1770
I have enclosed a duplicate copy of this sheet.

I am the ☐ applicant/inventor

☐ assignee of record of the entire interest. See 37 CFR 3.71.

☐ Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96).

☐ attorney or agent of record.

☒ attorney or agent under 37 CFR 1.34(a).

Registration number if acting under 37 CFR 1.34(a) 35027

WARNING: Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

July 6, 2009

Date

Signature

William D. Bunch

Typed or printed name

NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below.

☒ Total Of 2 forms are submitted.

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re application of : July 6, 2009
HOEFER ET AL. : Group Art Unit: 1794
Filed: November 18, 2005 : Examiner: CHANG, Victor S.
Serial No.: 10/138,854 : Docket No.: W9543-01

**For: Adsorbing Material Comprised of Porous Functional Solid
Incorporated in a Polymer Matrix**

APPEAL BRIEF

Sir:

Pursuant to the Notice of Appeal filed on March 3, 2009, Applicants hereby submit this Brief and Appendices. The period for submitting the Appeal has been extended by two (2) months to July 3, 2009, in view of the enclosed request for Extension of Time, and authorization therein to charge the appropriate fee to Deposit Account No. 07-1770.

<u>CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8</u>	
Pursuant to 37 CFR §1.8, I hereby certify that I have a reasonable basis to expect that this correspondence will be deposited with the United States Postal Service on or before the date indicated, as First Class mail, in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.	
<u>July 6, 2009</u> Date	<u>[Signature]</u> Signature

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1. **Real Party in Interest**

Grace GmbH & Co. KG is the real party and interest in this Appeal. Applicants' agreement to assign the application is confirmed by a separate Assignment agreement executed by the Applicants on November 26, 2004.

2. **Related Appeals and Interferences**

The undersigned is not aware of any other appeals or Interferences related to this appeal.

3. Status of Claims

Claims 1, 2, 4-8 and 11-14 are appealed and are attached in the Claims Appendix. Claims 1, 2, 4-8 and 11-14 are pending and finally rejected for the reasons stated in an Office Action mailed December 3, 2008.

4. Status of Amendments

Claims 1, 4, 6, 7, 13, 14, 15, 17, 18, 19, 20, 21, 22, 23, 25, 28 and 30 have been amended in this application by the Preliminary Amendment and Response to Restriction Requirement filed November 6, 2007. No Amendment after Final Rejection has been submitted after the December 3, 2008, Office Action.

5. Summary of the Claimed Subject Matter

Applicants' claimed subject matter relates to the field of adsorbent materials. Claim 1 relates to an adsorbing material having at least one porous functional solid incorporated in a polymer matrix, the adsorbing material containing the porous functional solid in an amount of 45 to 80 wt.% relative to the weight of the finished and activated adsorbing material. The polymer matrix has at least one organic polymer and has a secondary pore volume in addition to the primary pore volume of the porous functional solid, wherein the secondary pore diameter ranges between 4 nm to 3000 nm (see claim 1). The secondary pore volume is formed by removal of a rheological additive from the adsorbing material (page 15, line 15, to page 17, line 29, of the subject specification).

6. Grounds of Rejection to be Reviewed on Appeal

(1) Claims 1, 2, 4-8 and 11-13 stand rejected under 35 U.S.C. §102(b) or under 35 U.S.C. §103(a) over U.S. Patent No. 5,114, 584 ("Scheckler et al.").

The following is recited on page 2 of the September 24, 2008, Office Action:

Scheckler's invention relates to a porous filter body comprising at least about 75 weight percent of zeolite molecular sieve material (adsorbing material) and from about 9 to about 20 weight percent of nylon [abstract; col. 3, ll. 15-16]. Various commercially available nylons include Nylon-6, Nylon-6/6, Nylon-6/9, Nylon-6/12 Nylon-11, and Nylon-12 can be used [col. 5, ll. 10-12]. Fig. 1 illustrates that a mixture of molecular sieve, powdered thermoplastic material, such as the powdered nylon, etc., is charged to a mixer to form a homogeneous mixture, transferred to a die, pressed to a green body, transferred to a furnace and heated under a reduced pressure from about 450 to about 460°F to form a porous filter body containing less than 0.5 wt% of moisture [col. 6, ll. 61 through col. 7, ll. 46]. The porous filter body generally has a density from about 14 to about 25 g/in³ [col. 9, ll. 18-21].

For claims 1 and 2, Scheckler's molecular sieve or zeolite reads on the "porous functional solid" of the claimed invention. Since Scheckler teaches a porous filter body, the nylon powder in the molding mixture inherently forms a polymer matrix, which necessarily has a porous structure for providing access to the adsorbing molecular sieve particles. Scheckler is silent about the pore diameter of the polymer matrix (secondary pore diameter). However, since Scheckler teaches the same subject matter for the same end use, and workable pore diameter of the polymer matrix is deemed to be either anticipated, or an obvious routine optimization to one of ordinary skill in the art, motivated by the desire to meet end use requirements of various applications.

For claims 4 and 5, Scheckler teaches that various zeolite molecular sieves can be used [col. 3, ll. 15 through col. 4, ll. 52].

For claims 6-8, the thermal properties of nylon are deemed to be inherent to the same chemistry.

For claim 11, Scheckler teaches a molded article, which inherently has a shape.

For claim 12, Scheckler teaches that the molecular sieve has a theoretical equilibrium water capacity of 24 wt% [col. 4, ll. 42], and teaches an improved water capacity which is substantially greater than the water capacity of prior art filter bodies [col. 9, ll. 55-58]. A workable water capacity is deemed to be an obvious routine optimization to one of

ordinary skill in the art, motivated by the desire to obtain required absorbing properties for the same end use as the claimed invention.

For claim 13, Scheckler teaches that the porous filter body generally has a compressive strength of at least about 500 lb/in² [col. 9, ll. 29-32]. A workable compressive strength measured in N/m² is deemed to be anticipated, or obviously provided by practicing the invention of prior art.

(2) Claims 14 also stands rejected over 35 U.S.C. §103(a) over

Scheckler et al.

The following is recited on page 4 of the September 24, 2008, Office Action:

The teachings of Scheckler are again relied upon as set forth above.

For claim 14, absence of evidence to the contrary, the Official notice in the prior office action that "a filter body having a honeycombed geometry for an improved efficiency is common and well known" has been taken as admitted prior. It would be an obvious to one of ordinary skill in the art to make Scheckler's porous filter body in a honeycombed geometry, because the selection of a known material based on its suitability for its intended use supported a *prima facie* obviousness determination. See MPEP §2144.07. It should be noted that claim 14 was inadvertently included in the 102/103 rejection in the prior office action. Nevertheless, the correction to withdraw the 102 rejection over claim 14 does not constitute a new ground of rejection, because it has been properly rejected under the 103 rejection as well.

7. Arguments

(1) Rejection of claims 1, 2, 4-8 and 11-13 under 35 U.S.C. §102(b) over Scheckler.

Scheckler et al. discloses a filter body comprised of at least about 75 wt.% of molecular sieve material and from about 9 to about 20 wt.% of nylon. All pores of said molecular sieve are smaller than about 4 Angstroms. This pore size definition relates to the primary pore volume. In Scheckler et al., no figures or information are given for the secondary pore structure. Nevertheless, there are statements in Scheckler et al. about porosity, namely in column 9, lines 40-54, and example 1 column 12, lines 26 to 30, where a pressure drop over a shaped body is discussed. This corresponds to a quite open secondary pore structure with large macroscopic pores allowing substantial amounts of fluid travelling through. This observation is supported by the Abstract describing bodies with surprisingly low densities of "about 10 to about 25 grams per cubic inch," which corresponds to 0.61g/cm^3 to 1.52g/cm^3 . Where a porous body possesses a density below 2g/cm^3 , a macro-porous structure is present (i.e., macropores are larger than 10 microns) allowing readable pressure drops over such bodies. Moreover, the material of Scheckler et al. is not fabricated using a rheological additive, which will result in different pore structure.

In comparison, the porous body of the present invention possesses a meso-porous structure does not allow for passage of fluid or gas through the material. The corresponding bodies would have an unlimited pressure drop. The presently disclosed bodies in the present application possess a secondary pore structure that provides desirable adsorption properties. The secondary pore volume recited in claim 1 is formed with pores having diameters of 4 to 3000 μm , i.e., only small interstices, which provides dense bodies having increased water pick up. There is no disclosure in Scheckler et al. regarding secondary pore volume.

Moreover, Scheckler et al. discloses an adsorbent body having particle sizes of the molecular sieves greater than $250\mu\text{m}$ (col. 4, lines 21-31). Because large particle sizes lead to large voids between arrangements of particles, this also supports the presence of large macro-porous secondary pore structures in the Scheckler et al.

adsorbent body, i.e., of channels allowing a fluid to pass completely through the structure.

Since Scheckler et al. does not disclose the pore structure of the material recited therein, it does not teach all of the elements recited in claim 1. Thus, the subject-matter of claims 1, 2, 4-8 and 11-13 is not anticipated by the disclosure of Scheckler et al.

Moreover, it is submitted that the subject matter of claims 1, 2, 4-8 and 11-13 is not inherently disclosed by Scheckler et al. There is no mention or suggestion in the December 3, 2008, Office Action as to why Scheckler et al. inherently possesses the instantly claimed property (i.e., the secondary pore volume recited in the subject claims). Inherent anticipation requires that the missing descriptive material is "necessarily present," not merely probably or possibly present in the prior art. *Trinteo Industries v. Top U.S.A. Corp.*, 295 F.3d 1292, 1295, 63 USPQ2d 1597, 1599 (Fed. Cir. 2002) quoting *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999).

Additionally, facts asserted to be inherent in the prior art must be shown by evidence from the prior art. *Elan Pharmaceuticals, Inc. v. Mayo Foundation for Medical Education and Research*, 304 F.3d 1221, USPQ2d 1292 (Fed. Cir. 2001). *In re Dembiczak*, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) (criticizing the "hindsight syndrome wherein that which only the inventor taught is used against its teacher").

As above-mentioned, Scheckler et al. describes a porous material that possesses secondary pore volume that allows fluid to pass through it (i.e., macroporous channels). The teachings of Scheckler et al. do not even remotely hint as to the pore size of the secondary pore volume.

Moreover, since the body set forth in Scheckler et al. is prepared using large molecular sieve particles, the channels set forth therein are macroporous and allow for passage of fluid completely through the body, which also is evidenced by the very low density of the body. In addition, the secondary pores of the material of the present invention are formed utilizing a rheological additive, which is different from the process set forth in Scheckler et al. These differences provide evidence that the body of Scheckler et al. would not necessarily possess the pore structure recited in the present

claims, and in fact would indicate to one of ordinary skill in the art that such body would not possess the pore size as recited in the present claims. Thus, Scheckler et al. does not describe absorbent bodies that inherently possess the instantly claimed secondary pore volume.

Accordingly, it is submitted that the subject matter of claims 1, 2, 4-8 and 11-13 is not inherently disclosed by the above-identified references, and Applicants respectfully request withdrawal of the §102 rejection.

(2) Rejection of claims 1, 2, 4-8 and 11-14 under 35 U.S.C. §103(a) over Scheckler et al.

As above-mentioned, Scheckler et al. is completely silent regarding the size of pores for the secondary pore volume of the adsorbent body described therein. In addition, Scheckler et al. also teaches the artisan to prepare adsorbent bodies having large pores. This is in total contradiction to the smaller pore volumes recited in the present claims. Thus, the disclosure of Scheckler et al., would not provide either the teachings or the motivation for the artisan to prepare an adsorptive body having the secondary pore volume recited in the present claims.

The Examiner bears the burden of establishing a *prima facie* case of obviousness, *In re Deuel*, 51 F.3d 1552, 34 USPQ2d 1210 (Fed. Cir. 1995), *In re Rijckaert*, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993); *In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ 2d 1443, 1444 (Fed. Cir. 1992). Only if this burden is met does the burden of coming forward with rebuttal argument or evidence shift to the applicant. *Rijckaert*, 9 F.3d at 1532, 28 USPQ2d at 1956. When the references cited by the examiner fail to establish a *prima facie* case of obviousness, the rejection is improper and will be overturned. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988).

The combination of elements in a manner that reconstructs the applicant's invention only with the benefit of hindsight is insufficient to present a *prima facie* case of obviousness. There must be some reason, suggestion, or motivation found in the prior art whereby a person of ordinary skill in the field of the invention would make the

combination. That knowledge cannot come from the applicant's invention itself. *Diversitech Corp v. Century Steps, Inc.*, 850 F.2d 675, 678-79, 7 USPQ2d 1315, 1318 (Fed. Cir. 1988); *In re Geiger*, 815 F.2d 686, 687, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987); *Interconnect Planning Corp. v. Feil*, 774 F.2d 1132, 1147, 227 USPQ 543,551 (Fed. Cir. 1985).

In the instant case, Applicants respectfully submit that the June 20, 2008, Office Action does not set forth any statements of record to supplement the silences of the cited reference. Moreover, there has been no suggestion or motivation set forth to this Office Action that would lead one of ordinary skill in the art to the claimed invention. In particular, on page 3 of the June 20, 2008, Office Action it is stated that:

For claims 1 and 2, Scheckler's molecular sieve or zeolite reads on the "porous functional solid" of the claimed invention. Since Scheckler teaches a porous filter body, the nylon powder in the molding mixture inherently forms a polymer matrix, which necessarily has a porous structure for providing access to the adsorbing molecular sieve particles. Scheckler is silent about the pore diameter of the polymer matrix (secondary pore diameter). However, since Scheckler teaches the same subject-matter for the same end use, a workable pore diameter of the polymer matrix is deemed to be either anticipated, or obviously provided by practicing the invention of the prior art, dictated by the same end use.

As above-mentioned, Scheckler et al. is completely silent regarding secondary pore volume of the adsorbent body described therein. Moreover, one of ordinary skill in the art, after reviewing of Scheckler et al., would not have been motivated to form the instantly claimed secondary pore volume in the adsorbent body described therein since the teachings of Scheckler et al. lead one to macroporous or large channels of pore sizes. The pore sizes recited in the present claims are much smaller than those described in Shecker et al. As mentioned above, this is evidenced by the large pressure drop through the body described in Scheckler et al. The material of the instantly claimed invention has little or no pressure drop. In addition, there are no teachings in Scheckler et al. that would enable the artisan to obtain adsorbent bodies having the instantly claimed pore sizes. That is, there is no process described or suggested in Scheckler et al. that would yield a material having such pore sizes.

Therefore, Applicants submit that no *prima facie* case of obviousness has been set forth in previous Office Actions.

Accordingly, it is submitted that the subject matter of claims 1, 2, 4-8 and 11-14 are not rendered obvious by Scheckler et al. Applicants respectfully request withdrawal of this rejection.

In view of the above remarks, Applicants earnestly solicit a notice indicating that the above rejections are reversed and that claims 1, 2, 4-8 and 11-14 are allowable.

Respectfully submitted,



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Dated this 6th day of July 2009.

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Claims Appendix

Claim 1 (Previously Amended) An adsorbing material comprising at least one porous functional solid incorporated in a polymer matrix, said adsorbing material containing the porous functional solid in an amount of 45 to 80 wt.% relative to the weight of the finished and activated adsorbing material, and said polymer matrix comprising at least one organic polymer, and having a secondary pore volume in addition to the primary pore volume of the porous functional solid, wherein the secondary pore diameter ranges between 4 nm to 3000 nm.

Claim 2 (Original) An adsorbing material according to claim 1, wherein the amount of the organic polymer is 20 to 55 wt.% relative to the weight of the finished and activated adsorbing material.

Claim 3 (Canceled).

Claim 4 (Previously Amended) An adsorbing material according to claim 3, wherein the porous functional solid comprises zeolites of the groups 1, 2, 3, 4, 5, 6 and 7, compositions with structures iso-type, respectively, iso-morphous to the aforementioned types of zeolites, silica gels, silica-cogels and any combination thereof.

Claim 5 (Original) An adsorbing material according to claim 4, wherein the zeolites of the groups 1, 2, 3, 4, 5, 6 and 7 are selected from the members of the zeolite families A, X and Y.

Claim 6 (Previously Amended) An adsorbing material according to claim 1, wherein the decomposition temperature of the organic polymer is 180 to 450°C, provided that the organic polymer is subjected to heat treatment at said decomposition temperatures for a duration of at least 1h.

Claim 7 (Previously Amended) An adsorbing material according to claim 1, wherein the melting temperature of the organic polymer is 100 to 390°C. Claim 8 (Original) An

adsorbing material according to any of claim 1 to 7, wherein the organic polymer is selected from thermoplastics.

Claim 9 (Canceled).

Claim 10 (Canceled).

Claim 11 (Original) A shaped article comprising or consisting of an adsorbing material as defined in any of claims 1 to 10.

Claim 12 (Original) A shaped article according to claim 11 having a water adsorption capacity as measured at 80% relative humidity and at 25°C of at least 18 wt.% (relative to the weight of the finished and activated shaped article).

Claim 13 (Previously Amended) A shaped article according to claim 11 having a compressive strength of 150 N/mm² or higher, as measured by tensile/compressive testing machine model 30 1455 from Zwick with a 20 kN gauge from Zwick and a piston displacement rate of 1mm/min.

Claim 14 (Previously Amended) A shaped article according to claim 11 having a honeycombed geometry.

Claim 15 (Previously Amended) A method for preparing a shaped article comprising the steps of:

- a) forming a compound comprising at least one porous functional solid, at least one organic polymer and at least one removable rheological additive;
- b) shaping said compound into a green body;
- c) substantially or at least partially removing said rheological additive from the green body; and
- d) optionally activating the green body obtained from step c) at a temperature of at least 90 °C;

wherein said method results in the adsorbing material of claim 1.

Claim 16 (Original) A method according to claim 15, wherein the compound of step a) comprises 40 to 70 wt.% of porous functional solid, 20 to 50 wt.% of organic polymer and 0.5 to 25 wt.% of removable rheological additive, in each case relative to the weight of the total compound.

Claim 17 (Previously Amended) A method according to claim 15, wherein the removable rheological additive has an evaporation and/or 25 decomposition temperature of 140°C to 300°C, provided that the removable rheological additive is subjected to heat treatment at said evaporation and/or decomposition temperatures for a duration of at least 1h.

Claim 18 (Previously Amended) A method according to claim 15, wherein the removable rheological additive is selected from waxy components and/or oils.

Claim 19 (Previously Amended) A method according to claim 18 wherein the waxy component comprises natural waxes, semi-synthetic waxes, synthetic waxes, modified, oxidized or microcrystalline forms of the aforementioned waxes and any combination of these.

Claim 20 (Previously Amended) A method according to claim 18 , wherein the waxy component is a synthetic wax, preferably a polyolefin wax, ethylene-vinyl acetate copolymer, ethylene-vinyl alcohol, polyolefin glycol, amide wax or any combination of these.

Claim 21 (Previously Amended) A method according to claim 15 , wherein steps a) and b) are carried out continuously.

Claim 22 (Previously Amended) A method according to claim 15 wherein in step b) shaping of said compound into said green body is performed by extrusion or injection molding.

Claim 23 (Previously Amended) A method according to claim 15 , wherein in step c) the rheological additive is removed by heat treatment, extraction, particularly solvent extraction, and any combination of these.

Claim 24 (Canceled).

Claim 25 (Previously Amended) A method according to claim 24 wherein the heat treatment is carried out at a temperature of 140°C to 300°C.

Claim 26 (Canceled).

Claim 27 (Original) A method according to claim 23, wherein solvent extraction is used, optionally supported by ultrasonic treatment.

Claim 28 (Previously Amended) A method according to claim 27, wherein the solvent extraction is carried out at a temperature of 20°C to 120°C.

Claim 29 (Canceled).

Claim 30 (Previously Amended) A method according to claim 27 , wherein the extracting solvent comprises water, C₁-C₆ alcohols, C₃-C₈ ketones and any combination thereof.

Claim 31 (Original) A method according to claim 30, wherein the extracting solvent further comprises at least one emulsifier.

Claim 32 (Canceled).

Claim 33 (Canceled).

Claim 34 (Canceled).

Claim 35 (Canceled).

Claim 36 (Canceled).

Claim 37 (Canceled).

Claim 38 (Canceled).

Claim 39 (Canceled).

Claim 40 (Canceled).

Claim 41 (Canceled).

Claim 42 (Canceled).

Claim 43 (Canceled).

Claim 44 (Canceled).

Claim 45 (Canceled).

Claim 46 (Canceled).

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Docket No. W9543-01
Appeal Brief dated July 6 2009

Evidence Appendix

None

Serial No.: 10/500,349
Docket No. W9543-01
Appeal Brief dated July 1, 2009

Related Proceedings Appendix

None